

CAP 1732 CONSOLIDATED RESPONSE DOCUMENT 2
Questions and Answers from the CAA/AIM/Surveyors meeting

This document includes questions to CAP 1732 Aerodrome Survey Guidance received from external survey experts and the CAA’s responses to them which was provided at or after the meeting CAA/AIM/Surveyors which took place in the Aviation House Gatwick on the 19th July 2019.

No	Question/Issue	Sender	Response
1.	We would like to get a better understanding of the reason for the difference in minimum obstacle height filters between eTOD Plus and eTOD as described in Part ADR-OPS and Annex 15, e.g. 0.5m or 3m in Area 2b. As lower minimum height requirements will increase survey costs, all aerodrome operators we have discussed this with say that they would prefer to apply the EASA guidance. If the CAA considers there is a real benefit to applying the lower eTOD-Plus heights, I think additional explanation would be useful.	SLC	<p>Obstacles of less than 3m may be required for IFP design purposes and it was noted at the meeting (CAA/AIM/Surveyors, 19/7/19) that aerodromes must instruct surveyors on the height of obstacles to be collected (e.g. by including requirements in formal arrangements with the surveyor) and, for aerodromes to carry out an effective assessment of the requirements, close collaboration between the aerodrome operator, ANSP and the chosen IFP designer would be required (through this collaboration it should be possible to gain an understanding of the reasons for any requirements for the collection of obstacles at lower heights.</p> <p>Following collaboration between the aerodrome operator, ANSP and the chosen IFP designer should it be concluded that eTOD Plus heights are not required to be applied. CAP 1732 CRD 1 refers: Applying minimum slope/height has a direct impact on the OCA/H, therefore:</p> <ol style="list-style-type: none"> 1. If it is an aerodrome operator’s decision to apply a minimum obstacle collection height different to those defined for eTOD PLUS, it should be annotated in the survey report part “any differences to CAP 1732”. This height will need to be included in IFP designs. An AltMoC submission would not be required if applied values are the same as required by EASA/ICAO for eTOD. 2. If it is an aerodrome operator’s decision to apply an additional obstacle filtering process, it should be annotated in the survey report part “any differences to CAP 1732” and it would require an assessment as per Chapter 7 CAP 1732. An AltMoC submission would be required if applied values are not compliant with those required by EASA/ICAO for eTOD. <p>Additionally, at the CAA/AIM/Surveyors meeting, the CAA IFP Regulator took actions to:</p> <ul style="list-style-type: none"> - review the existing assessment of the eTOD Plus obstacle collection surfaces for Areas 2b and 2c to make sure that aerodrome operators would not be collecting any data which may be

			<p>irrelevant for IFP design in the context of current regulatory environment and potential changes to ICAO requirements;</p> <ul style="list-style-type: none"> - provide an explanation as to why objects at heights down to 0.5 m may be required for IFP design and consider adding it as a note in the next edition of CAP 1732.
2.	<p>We think it would be sensible to apply additional filtering/shadowing of obstacles as well, particularly of small obstacles near very tall obstacles. We are looking at criteria to define this in or formal arrangements, but it may be useful to have some additional guidance within CAP1732.</p>	SLC	<p>It should be noted that the ICAO Annex 15 text does not allow for filtering / shadowing to be applied. As per CRD to 1732: Applying minimum slope/height has a direct impact on the OCA/H, therefore:</p> <ol style="list-style-type: none"> 1. If it is an aerodrome operator's decision to apply a minimum obstacle collection height different to those defined for eTOD PLUS, it should be annotated in the survey report part "any differences to CAP 1732". This height will need to be included in IFP designs. An AltMoC submission would not be required if applied values are the same as required by EASA/ICAO for eTOD. 2. If it is an aerodrome operator's decision to apply an additional obstacle filtering process, it should be annotated in the survey report part "any differences to CAP 1732" and it would require an assessment as per Chapter 7 CAP 1732. An AltMoC submission would be required if applied values are not compliant with those required by EASA/ICAO for eTOD. <p>As noted in 1. above for aerodromes to carry out an effective assessment close collaboration between the aerodrome operator, ANSP and the chosen IFP designer would be required.</p>
3.	<p>We have also been looking at methods for surveying the extents of obstacles. This has highlighted a number of practical issues in the measurement and delivery of this data. The Eurocontrol TOD manual discusses the delivery of obstacle extents, but the guidance cannot be directly applied using the CAP1732 data format.</p>	SLC	<p>Horizontal extent is a mandatory attribute of an obstacle. Currently (using CAP 232 surveys) IFP designers are applying an unrealistic horizontal extent for every obstacle. This has a negative effect on all other datasets based on the survey data and may even generate a risk to air navigation in the case of large or irregular obstacles. Horizontal extent should be applied to objects that have height AGL. The horizontal extent should be provided to the nearest metre. 1 m is the minimum horizontal extent that can be recorded in survey files.</p> <p>The extent must cover the whole footprint of the obstacle. Post-meeting note: NATS AIM has confirmed that the extent of the obstacle provided in CAP 1732 survey report is applied to create Type A chart. Post-meeting note 2: AIMR confirmed with AIXM experts that UK method of describing all obstacles based on the position, height and horizontal extent rather than polygons is - at the moment - the best what we can do to ensure that the whole obstacle is taken into account e.g. for Type A, as in practice publications are not ready to use polygons yet (although it is possible in AIXM).</p>

4.	The guidance for the implementation of Area 3 provided in CAP1732/EASA/ICAO is quite vague, presumably deliberately so. However, this means that the surveyors need to consider how to meet the requirements where the configuration of the aerodrome is not reflected by the description in Part ADR-OPS and Annex 15/PANS-AIM. It may be useful to discuss whether some more specific guidelines are produced so that all surveyors apply a similar interpretation.	SLC	eTOD Area 3 is depicted in Annex 15 Appendix 8, Figure A8-3 and AMC&GM to 139/2014 GM4 ADR.OPS.A.005(a) Aerodrome data. Additional guidance added to Appendix 2. Any terrain or obstacles whose elevation is 0.5m or greater than the elevation of the nearest point on the movement area should be collected. This results in data being collected for only those “islands” where this surface has been penetrated. No data is collected within the Area 3 data set for other objects or terrain which exist below this assessment surface.
5.	Taxiway centrelines are now included as an item in the data lists. However, as these are line features as opposed to point features, it would be useful to know how it is intended this data will be used so that we ensure we survey and deliver this data correctly.	SLC	Please note that the appropriate points to be provided are identified in the AMC/GM to 139/2014. AMC1 ADR.OPS.A.005 Aerodrome data The following data are measured or described, as appropriate, for each facility provided on the aerodrome: (k) The geographical coordinates of: (1) each threshold; (2) appropriate taxiway centre line points; “Appropriate” = as described/depicted in AMC/GM to 139/2014.
6.	Over what period will the AIP be updated following changes to survey data?	Paul Fassam MRICS	NATS AIM always intend to process data without undue delays but they must also align resources based on the priority of received tasks to make sure that the service is provided in an effective and efficient way. Therefore, in practice two AIRAC cycles (2 x 28 days) are required to process data and AIP and send AIP changes back to the sponsor for approval.
7.	Will updates be automatic or will a 1560C still apply?	Paul Fassam MRICS	1560C and CAA approval task for RDD in Aurora co-exist and there is a dependency between them (AIP CR will not be approved unless 1560C has been submitted). CAA Aerodrome Inspectors advise aerodrome operators to submit their 1560C form BEFORE the AIP CR or at the same time (at the latest) so that when they receive an approval task in Aurora they are already aware of those changes to RDD and can approve them in Aurora without undue delay.

8.	Will the ILS basic surface still be used under CAP1732?	Paul Fassam MRICS	CAP 232 includes ILS Basic Surfaces area, CAP 1732 requirements are more demanding and apply to all IFP aerodromes therefore it fully replaces CAP 232.
9.	Digital files are acceptable as zipped CSV with header?	Paul Fassam MRICS	Yes.
10.	Since they are now Zipped can the CRC Field be left blank? If not what method for CRCing should be used.	Paul Fassam MRICS	Yes.
11.	Obstacle Collection Surface (OCS) What level of detail is required where the ground penetrates the OCS?	Paul Fassam MRICS	Terrain, woods and other large obstacles penetrating OLS should be defined in a way that covers the whole extent of the obstacle. NATS AIM took an action to investigate how large obstacles can be defined by a number of points using the current dataset specification and AIS AIXM database. Post-meeting note: AIMR confirmed with AIXM experts that UK method of describing all obstacles based on the position, height and horizontal extent rather than polygons is - at the moment - the best what we can do to ensure that the whole obstacle is taken into account e.g. for Type A, as in practice publications are not ready to use polygons yet (although it is possible in AIXM).
12.	Do we need to survey a 1.5m high washing line pole, in someone's back garden if the ground penetrated the OCS?	Paul Fassam MRICS	All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that extend above a defined surface intended to protect aircraft in flight should be surveyed.
13.	Where street lights are 3m above traffic on a road do we add the vehicle height?	Paul Fassam MRICS	Road traffic should be considered as 4.8 m unless max height of a vehicle is defined specifically for the road. To be included in CAP 1732 v1.1.
14.	In a coppice or wood do we add the polygon with the highest tree height or add multiple point heights?	Paul Fassam MRICS	Terrain, woods and other large obstacles penetrating OLS should be defined in a way that covers the whole extent of the obstacle. NATS AIM took an action to investigate how large obstacles can be defined by a number of points using the current dataset specification and AIS AIXM database. Post-meeting note: AIMR confirmed with AIXM experts that UK method of describing all obstacles based on the position, height and horizontal extent rather than polygons is - at the moment - the best what we can do to ensure that the whole obstacle is taken into account e.g. for Type A, as in practice publications are not ready to use polygons yet (although it is possible in AIXM).

15.	Where a building is under construction do we keep the same unique reference number and amend the height as the development proceeds or use a proposed height if available?	Paul Fassam MRICS	<p>Keep the same unique ID. NATS AIM to provide an AIXM UUID Master repository.</p> <p>Post-meeting note: UUID for obstacle areas and aerodrome features can be obtained from the AIS Portals SDO Explorer tool. AIM welcome UUIDs from surveyors for Obstacles which can be done by appending an extra (last) field to the existing fields (please see item 20 below).</p> <p>UUID generation algorithms guarantee that the risk for the same UUID value to be generated by another system, for another feature, is extremely low. Information about such algorithms is provided in Appendix 1 of http://www.aixm.aero/sites/aixm.aero/files/imce/AIXM51/aixm_feature_identification_and_reference-1.0.pdf</p>
16.	An aerodrome has never heard of and does not have a login – what is the process to bring them up to speed?	Paul Fassam MRICS	AO to contact NATS AIM & sign the FA.
17.	How do we input polygon and line data into a point based .csv system?	Paul Fassam MRICS	<p>NATS AIM took an action to investigate how large obstacles can be defined by a number of points using the current dataset specification and AIS AIXM database.</p> <p>Post-meeting note: AIMR confirmed with AIXM experts that UK method of describing all obstacles based on the position, height and horizontal extent rather than polygons is - at the moment - the best what we can do to ensure that the whole obstacle is taken into account e.g. for Type A, as in practice publications are not ready to use polygons yet (although it is possible in AIXM).</p>
18.	What is meant by GeoTIFF + Header? Manually created meta tags?	Paul Fassam MRICS	<p>Yes. Please note that this is a new process and it may need to be amended if there are any issues identified with the original arrangements.</p> <p>Post-meeting note: It is recommended that terrain data is provided with a metadata.xml file or for ESRI Shape Files a .shp.xml metadata file containing all mandatory metadata items. This way AIM will be able to store the mandatory metadata and store the GeoTiff/asc/shp files.</p>
19.	Is stating 100% confidence OK if we exceed the required accuracy?	Paul Fassam MRICS	<p>Confidence Level: The probability that the true value of a parameter is within a certain interval around the estimate of its value. The interval is usually referred to as the accuracy of the estimate. A</p>

		<p>required confidence level of 90% indicates that 90% of the measured points should meet their respective accuracy requirements.</p> <p>It should be noted that the required confidence level for obstacles published in the AIP is 95% (see ICAO Annex 15, paragraph 3.7.6) and that, if the electronic data set is to act as the source of this information, a higher confidence level than the 90% required in Table A8-2 will be needed.</p> <p>Horizontal confidence level: The probability that the true value of a parameter is within a certain interval around the estimate of its value. The interval is usually referred to as the accuracy of the estimate. As this confidence level is typically determined by the process and technique applied to gather the source data, and a data set often comprises information gathered through several surveys, it is recommended that the confidence level is reported for each individual post measurement (data level), for each area included in the data set, and also for the entire data set.</p> <p>Horizontal Accuracy: The horizontal accuracy provides the maximum permitted difference between a measured horizontal position and reality, which must be achieved with the corresponding level of confidence. For example, the horizontal accuracy may be 5m with a confidence level of 90%. This indicates that 90% of the measured points will have a maximum horizontal deviation of 5m from the true value.</p> <p>Vertical Accuracy: The vertical accuracy provides the maximum permitted difference between the measured elevation of an obstacle and reality, which must be achieved with the corresponding level of confidence. For example, the vertical accuracy may be 3m with a confidence level of 90%. This indicates that 90% of the measured elevations will have a maximum vertical deviation of 3m from the true value.</p> <p>Vertical confidence level: The probability that the true value of a parameter is within a certain interval around the estimate of its value. The interval is usually referred to as the accuracy of the estimate As this confidence level is typically determined by the process and technique applied to gather the source data, and a data set often comprises information gathered through several surveys,</p>
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20.	What are the columns required for a CAP1732 Survey? This has not been confirmed in the latest CAP1732 documents.	P e l l F r i s c h m a n n	<p>Files should be delivered without gaps (continue numbering), as per below.</p> <table border="1"> <tr> <td>Field 14</td> <td>Easting</td> </tr> <tr> <td>Field 15</td> <td>Northing</td> </tr> <tr> <td>Field 16</td> <td>VERTICAL REFERENCE SYSTEM</td> </tr> <tr> <td>Field 17</td> <td>ORTHOMETRIC HEIGHT (M)</td> </tr> <tr> <td>Field 18</td> <td>ORTHOMETRIC HEIGHT (FT)</td> </tr> <tr> <td>Field 19</td> <td>HEIGHT ABOVE GROUND LEVEL (M)</td> </tr> <tr> <td>Field 20</td> <td>HEIGHT ABOVE GROUND LEVEL (FT)</td> </tr> <tr> <td>Field 21</td> <td>HORIZONTAL EXTENT (M)</td> </tr> <tr> <td>Field 22</td> <td>HORIZONTAL ACCURACY (M)</td> </tr> <tr> <td>Field 23</td> <td>VERTICAL ACCURACY (M)</td> </tr> <tr> <td>Field 24</td> <td>RECORD IDENTIFIER</td> </tr> <tr> <td>Field 25</td> <td>SURVEY DATE</td> </tr> <tr> <td>Field 26</td> <td>CRVC</td> </tr> </table>	Field 14	Easting	Field 15	Northing	Field 16	VERTICAL REFERENCE SYSTEM	Field 17	ORTHOMETRIC HEIGHT (M)	Field 18	ORTHOMETRIC HEIGHT (FT)	Field 19	HEIGHT ABOVE GROUND LEVEL (M)	Field 20	HEIGHT ABOVE GROUND LEVEL (FT)	Field 21	HORIZONTAL EXTENT (M)	Field 22	HORIZONTAL ACCURACY (M)	Field 23	VERTICAL ACCURACY (M)	Field 24	RECORD IDENTIFIER	Field 25	SURVEY DATE	Field 26	CRVC
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21.	What form of assessment would be required to meet conformity so that the lack of Area 3 obstacle/terrain dataset does compromise safety of operations and it has been accepted by regular aerodrome users?	P e l l F r i s c h m a n n	<p><u>Consolidated response document:</u></p> <p>The lack of Area 3 datasets will not be considered as a non-compliance at an EASA certificated CAT I aerodrome only if:</p> <ul style="list-style-type: none"> - There is an assessment [as described in Chapter 7] presenting evidence as to whether the lack of Area 3 obstacle/terrain dataset does compromise safety of operations and it has been accepted by regular aerodrome users. - There is a plan for providing this data in the future (with a timescale). <p>The above documents will need to be approved by the CAA Aerodromes Team.</p> <p><u>Cap 1732 Chapter 7:</u></p>																										

			<p>Aerodrome operators may provide an assessment presenting evidence as to whether the lack of a particular TOD data area (or its part) or any other differences in requirement would not compromise the safety of operations and remains in accordance with EU 139/2014. The preparation of the assessment would require close collaboration between the aerodrome operator, ANSP and the chosen IFP designer. The assessment should also identify whether or not it is necessary to establish AltMoC. If AltMoc is needed, the aerodrome operator is to prepare an AltMoC proposal document which would require evaluation and acceptance by the CAA.</p> <p><u>139/2014:</u> Aerodrome Safety Management Manual should include: (...) (5) safety assessment process, including hazard identification and risk management schemes.</p>
22.	At present the only chart required by CAP1732 is the Aerodrome Plan? Airports require many plans but this is not covered in CAP1732 where as it was in Cap232.	P e l l F r i s c h m a n n	Any plans/charts provided by surveyors need to be agreed between themselves and aerodrome operators – this is not regulated by the CAA.
23.	At present AXIM data is not mandatory. Data is to be supplied as “...Survey package should be delivered to AIS as a single zip file containing relevant files listed in Chapter 2, points 2.8 and 2.9. This zip file should be submitted to AIS as a new AIP Change Request (ACR).” When is this likely to change and what software will be required to meet AXIM format?	P e l l F r i s c h m a n n	<p>AIM are happy to accept obstacles in AIXM format.</p> <p>Future provision of ICAO datasets will allow end users to view the modelling of more complex features and utilises the UUIDs.</p> <p>Once harmonised AIXM coding guidance is available, UK CAA will assess its applicability to the whole upstream data chain and the timescale required for full transformation. The earlier data originators decide to start using AIXM format, the better, but the implementation should be conducted in a harmonised way to support interoperability of those files.</p>

24.	There are some errors and omissions in the latest version of CAP168. When will these be addressed?	P e l l F r i s c h m a n n	This issue was reported to the Aerodrome Policy Team and will be addressed in the next amendment. Any identified errors should be reported directly to Tony Heap.												
25.	There is also known discrepancies between CAP168 and the EASA regulation documents. Which should be used for the processing of the data?	P e l l F r i s c h m a n n	When a discrepancy between CAP168 and the EASA or ICAO regulation is identified the AO/surveyor should always consult the CAA for guidance. As a general rule, the CAA will apply a pragmatic approach and whenever the ICAO Annex 14 or 139/2014 is less demanding than CAP 168, the less demanding requirement will usually be applied.												
26.	As a general point it would be good to see how IFP designers use our data.	P e l l F r i s c h m a n n	Overview of APDO activities was provided at the meeting and it was very well received especially that participants were not aware of some (especially UK-specific) elements of IFP design/approval and APDO approval/oversight process.												
27.	Proposal to allow multiple field association in the master obstacle file. The master obstacle file would then be definitive.	NATS AIM	<table border="1" data-bbox="904 703 1966 1118"> <thead> <tr> <th data-bbox="904 703 1207 772">Field 4 – ASSOCIATION</th> <th data-bbox="1207 703 1966 772"></th> </tr> <tr> <th data-bbox="904 772 1207 841">VALUES</th> <th data-bbox="1207 772 1966 841">DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td data-bbox="904 841 1207 909">AREA1</td> <td data-bbox="1207 841 1966 909">ICAO Area 1: entire territory of a State</td> </tr> <tr> <td data-bbox="904 909 1207 978">AREA2</td> <td data-bbox="1207 909 1966 978">ICAO Area 2: terminal control area.</td> </tr> <tr> <td data-bbox="904 978 1207 1046">AREA3</td> <td data-bbox="1207 978 1966 1046">ICAO Area 3: aerodrome/heliport movement area</td> </tr> <tr> <td data-bbox="904 1046 1207 1118">AREA4</td> <td data-bbox="1207 1046 1966 1118">ICAO Area 4: Category II or III operations area.</td> </tr> </tbody> </table> <p data-bbox="904 1161 2152 1262">Where a surveyed item has multiple associations to ICAO Areas, Field 4 shall contain all associations delimited with a forward slash e.g a surveyed item is associated with both ICAO Area 2 and 3, therefore Field 4 shall contain AREA2/AREA3</p>	Field 4 – ASSOCIATION		VALUES	DESCRIPTION	AREA1	ICAO Area 1: entire territory of a State	AREA2	ICAO Area 2: terminal control area.	AREA3	ICAO Area 3: aerodrome/heliport movement area	AREA4	ICAO Area 4: Category II or III operations area.
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